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LIGHTER  
[Raita]

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Claims

1. A lighter, characterized by the fact that it is equipped with a lighter body consisting of an ignition part and a fuel housing part, an outer case for internally housing the lighter body, a cover that is rotatably mounted via a hinge part at one side of the outer case and covers the ignition part of the above-mentioned lighter body, electrically connected light-emitting bodies that are arranged in the gap between the above-mentioned outer case and the lighter body and inside the cover, and a switch part for turning on or off the light-emitting bodies; in the above-mentioned outer case and cover, at least the part corresponding to the above-mentioned light-emitting bodies has a light transmission characteristic; and the switch part is operated by a cover opening operation of the above-mentioned cover, so that the above-mentioned light-emitting bodies are lit.

2. The lighter of Claim 1, characterized by the fact that it has several units of the above-mentioned light-emitting bodies; and these light-emitting bodies are sequentially flickered.

3. The lighter of Claim 1 or 2, characterized by the fact that the above-mentioned switch part consists of a contact member that is connected to one terminal of a battery which is arranged in the above-mentioned lighter body; a leaf spring that is forced in the contacting direction with the contact member; and a tongue segment that is installed in the vicinity of the hinge part of the above-mentioned cover and rotated along with the rotation of the cover.

Detailed explanation of the invention

[0001]

(Technical field of the invention)

The present invention pertains to a lighter that is used for igniting of smoking, etc.

[0002]

(Prior art)

In conventional lighters, lighters in which a decorative working is applied to the shapes themselves and lighters in which characters, patterns, etc., are printed on the surface of a case or to which papers printed with characters, patterns, etc., are attached are proposed. The decorations of these lighters stimulate the interest of consumers, render a function of exciting a purchase desire

of the consumers to the lighters, and raise the additional value of the lighters in addition to the ignition function intrinsic to the lighters.

[0003]

(Problems to be solved by the invention)

However, the decorations such as shapes and patterns that are applied to the conventional lighters were still without a change, and the consumers were apt to be tired of the decorations. In addition, since these lighters were carried and used mainly by the consumers and their size was limited, decorations rich in variety were difficult to be applied to the lighters.

[0004] Accordingly, the purpose of the present invention is to provide a portable small lighter in which the sense of use of consumers is improved and the consumers are not tired of the lighter by simply applying a decoration rich in variety.

[0005]

(Means to solve the problems)

In order to achieve the above-mentioned purpose, the lighter of the present invention is a lighter characterized by the fact that it is equipped with a lighter body consisting of an ignition part and a fuel housing part, an outer case for internally housing the lighter body, a cover

that is rotatably mounted via a hinge part at one side of the outer case and covers the ignition part of the above-mentioned lighter body, electrically connected light-emitting bodies that are arranged in the gap between the above-mentioned outer case and the lighter body and inside the cover, and a switch part for turning on or off the light-emitting bodies; in the above-mentioned outer case and cover, at least the part corresponding to the above-mentioned light-emitting bodies has a light transmission characteristic; and the switch part is operated by a cover opening operation of the above-mentioned cover, so that the above-mentioned light-emitting bodies are lit.

[0006] According to the lighter of the present invention with the above constitution, since a decoration rich in variety, in which light-emitting bodies are lit by utilizing a slight space in the lighter is applied onto the surface of a small portable lighter, a lighter in which the sense of use of consumers is improved and the consumers are not tired of the lighter is provided.

[0007]

(Embodiment)

Next, an embodiment of the present invention will be explained in detail referring to the figures. In this

embodiment, a lighter 1 is explained as a so-called disposable piezoelectric gas lighter.

[0008] The lighter 1, as shown in Figure 1, consists of lighter body 2, outer case 3 for internally housing the lighter body 2, and cover 4 which is mounted at one side of the outer case 3.

[0009] The lighter body 2 consists of an ignition part and a fuel housing part. The ignition part, as shown in Figure 3, includes operation button 5, metal cap 6, and jet nozzle 7.

[0010] The operation button 5 has a structure in which it can be slid in the vertical direction along a partition wall 19 of a gas tank 17 which will be mentioned later, and as shown in Figure 3, a high-voltage generator 8 is connected to one end surface. For this reason, if the operation button 5 is operated in the vertical direction, the high-voltage generator 8 is interlocked with the vertical operation of the operation button 5 and reciprocated in the vertical direction. In addition, an actuator 9 whose one end is fixed to the lighter body 2 is inserted into the high-voltage generator 8. If the high-voltage generator 8 is interlocked with the vertical operation of the operation button 5 and reciprocated in the vertical direction as mentioned above, the actuator 9 is

reciprocated in the high-voltage generator 8 and presses a piezoelectric element 10 which is arranged on a moving area of the actuator 9. If the piezoelectric element 10 is pressed, a high voltage is generated. The high voltage generated is guided to the vicinity of the tip of the jet nozzle 7, which will be mentioned later, by a discharge electrode 11.

[0011] The metal cap 6, as shown in Figure 3, is arranged on one end surface of the gas tank 17 of the fuel housing part which will be mentioned later, installed so that the jet nozzle 7 is surrounded, and exerts an effect as a wind shield during the ignition of the lighter 1. Moreover, in the metal cap 6, a hole part 12 into which the above-

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mentioned discharge electrode 11 is installed at one side adjacent to the above-mentioned operation button 5.

Furthermore, in the metal cap 6, the side opposite to one side at which the above-mentioned hole part 12 is installed is formed as a sandwiching part 14 for sandwiching the battery 13 being a power source of light-emitting bodies which will be mentioned later.

[0012] The jet nozzle 7, as shown in Figure 3, is arranged on one end surface of the gas tank 17 of the fuel housing part, which will be mentioned later, and its base end is



connected to a gas leading pipe 18 of the fuel housing part which will be mentioned later. The jet nozzle 7, as shown in Figure 3, consists of a large-diameter part 7a and a small-diameter part 7b, and one end 15a of a movable arm 15 is fitted to the small-diameter part 7b. One end 15a of the movable frame 15, as mentioned above, is fitted to the small-diameter part 7b of the jet nozzle and contacts with the lower surface of the large-diameter part 7a. In addition, in the movable arm 15, as shown in Figure 3, its other end 15b is protruded to a moving area of the operation button 5 through the hole part 12 of the above-mentioned metal cap 6, and its approximate intermediate part is supported by a support part 16. For this reason, if the other end 15b of the movable arm 15 is pushed down by the push-down operation of the operation button 5, its one end 15a is pushed up by using the support part 16 as a support point.

[0013] The fuel housing part, as shown in Figure 3, consists of the gas tank 17 which is closed by the partition wall 19 and the gas leading pipe 18 which is arranged in the gas tank 17.

[0014] The gas tank 17, as mentioned above, is closed by the partition wall 19, so that a fuel gas which is housed in the gas tank is prevented from being introduced into

other parts of the lighter 1. Moreover, the partition wall 19, as shown in Figure 3, rises between the jet nozzle 7 and a battery 13, and protects the battery 13 by shielding a flame of the lighter 1.

[0015] The gas leading pipe 18, as shown in Figure 3, is arranged in the gas tank 17, and its one end is connected to the base end of the jet nozzle 7 of the above-mentioned ignition part.

[0016] The outer case 3, as shown in Figure 1, is formed as a box with a rectangular parallelepiped shape whose one end surface is opened, and the lighter body 2 constituted as mentioned above is housed in the outer case. The lighter 1, as shown in Figure 1, in case the lighter body 2 is housed in the outer case 3, a gap is generated between both of them, and a double container structure is formed by the outer case 3 and the lighter body 2.

[0017] The cover 4, as shown in Figure 1, is mounted via a hinge part 20 at one side of the outer case 3.

Furthermore, the cover 4, as shown in Figures 1 and 2, can be opened when the lighter 1 is in use, and if the lighter is not in use, as shown in Figure 1, the cover is rotatably mounted via the hinge part 20 so that it can be closed.

Therefore, since the cover 4 is closed when the lighter 1 is not in use, the ignition part of the above-mentioned

lighter body 2 is covered and protected, and the ignition due to a wrong operation during carrying of the lighter is prevented. In addition, as shown in Figure 4, a ring part 21 is mounted at a hinge part 20 at the outside of the outer case 3, so that the lighter 1 can be carried through string, etc.

[0018] Moreover, a partition part 22 is installed as shown in Figure 1 in the cover 4, so that part of it has a double container structure similarly to the outer case 3.

[0019] Furthermore, it may not be necessary for the outer case 3 and the cover 4 to entirely have a light transmission characteristic, at least the part corresponding to light-transmitting devices 23, which will be mentioned later, as light-emitting bodies has a light transmission characteristic, and the luminous state of the above-mentioned light-emitting devices 23 may be a visual state from the outside.

[0020] In the lighter 1, as mentioned above, the outer case 3 and the cover 4 have a double container structure in which a fixed gap is generated. In the gap, as shown in Figure 1, several light-emitting devices 23 electrically connected as light-emitting bodies are arranged.

[0021] The light-emitting devices 23, as shown in Figure 1, are connected at a prescribed interval by a conducting wire

25 and inserted into the gap between the above-mentioned outer case 3 and cover 4. Needless to say, the light-emitting devices 23 may emit lights with the same color and may also emit lights with a combination of different colors. With various selections of light-emitting colors by the light-emitting devices 23 in this manner, various decorations can be expressed on the surface of the lighter 1. One end of the conducting wire 25 for connecting the light-emitting devices 23, as shown in Figure 3, is connected to a metal plate 26 in contact with the terminal of the battery 13 being a power source, and its other end is connected to a leaf spring 29 of a switch part 24 which will be mentioned later. In addition, part of the conducting wire 25, as shown in Figure 1, inserted into a cylindrical tube 27. In the conducting wire 25, as shown in Figure 2, if the cover 4 is opened, the part for connecting the light-emitting devices 23 which are arranged in the outer case 3 and the light-emitting devices 23 which are arranged in the cover 4 is exposed to the outside. The conducting wire 25 is easily damaged by the exposure to the outside. For this reason, the conducting wire 25 is inserted into the tube 27 to protect the conducting wire 25 by suppressing the exposure to the outside. Moreover, if the luminous state of the light-emitting devices 23 is

visible, for example, if the tube having a light transmission characteristic or the tube in which a hole part is installed in the part having the light-emitting devices 23 is used, the tube 27 may be mounted in the entire part of the conducting wire which is inserted into the lighter 1 to protect the conducting wire in the lighter 1. Furthermore, in this embodiment, the light-emitting bodies have been connected by the conducting wire 25, however after the light-emitting devices 23 is mounted on a substrate, the substrate may be connected by the conducting wire. In addition, in this embodiment, the light-emitting bodies that are arranged in the lighter 1 have been constituted as light-emitting devices, however without being limited to them, other light-emitting bodies may also be adopted.

[0022] The switch part 24, as shown in Figure 1, consists of a contact member 28 that is connected to the terminal of the battery 13 which is arranged in the above-mentioned lighter body 2, the leaf spring 29 that is forced in the direction in contact with the contact member 28, and a tongue segment 30 that is installed in the vicinity of the hinge part 20 of the cover 4.

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[0023] The contact member 28, as shown in Figure 1, formed by protruding part of the metal cap 6 of the above-mentioned lighter body 2 which is connected to one terminal of the battery 13. At the same time, as shown in Figure 4, the contact member is extended in the direction parallel with the leaf spring 29, which will be mentioned later, so that its shape is formed in an approximate L shape and positioned on a moving area of the leaf spring 29.

[0024] The leaf spring 29, as shown in Figure 1, is installed in the gap between one side at which the cover 4 of the outer case 3 is mounted and the lighter body 2. The leaf spring 29 is forced in the direction in contact with the above-mentioned contact member 28, and as mentioned above, since the above-mentioned contact member 28 is arranged on the moving area, it contacts with the above-mentioned contact member 28 and stops unless the leaf spring 29 is pressed. In addition, as shown in Figure 1, one end of the conducting wire 25 which is connected to the metal plate 26 whose one end contacts with the terminal of the battery 13 is connected to the leaf spring 29. Therefore, if the leaf spring 29 and the contact member 28 contact, the circuit which is constituted in the gap between the above-mentioned outer case 3 and lighter body 2

and in the cover 4, as mentioned above, becomes a closed circuit, so that current starts to flow.

[0025] The tongue segment 30, as shown in Figure 1, is installed in the vicinity of the hinge part 20 of the cover 4 and rotated along with the rotation of the cover 4. When the cover 4 is closed, as shown in Figure 4, the tongue segment 30 presses the above-mentioned leaf spring 29 in the separating direction from the above-mentioned contact member 28, and when the cover 4 is opened, as shown in Figure 5, the tongue segment is rotated along with the cover 4 and separated from the leaf spring 29, so that the pressure is released. Moreover, the tongue segment 30, as shown in Figure 1, may be integrated with the hinge part 20 of the cover 4 and may also be formed by mounting a member different from the hinge part 20 at the hinge part 20, if it is rotated along with the rotation of the cover 4.

[0026] The operation method of the lighter 1 with the above constitution will be explained below.

[0027] First, the operation for emitting the light-emitting devices 23 arranged in the lighter 1 will be explained.

[0028] When the cover 4 is closed, the tongue segment 30, as shown in Figure 4, presses the leaf spring 29 in the separating direction from the contact member 28. In addition, when the cover 4 is opened, as shown in Figure 5,

the tongue segment 30 is rotated by interlocking with the rotational operation of the cover 4 and separated from the leaf spring 29. Since the leaf spring 29, as mentioned above, is forced in the direction in contact with the contact member 28, if the pressure of the tongue segment 30 is released, the leaf spring contacts with the contact member 28 arranged in the moving area as shown in Figure 5.

[0029] The contact member 28, as mentioned above, contacts with one terminal of the battery 13. Moreover, as mentioned above, the other end of the conducting wire 25 whose one end is connected to the metal plate 6 in contact with the other terminal of the battery 13 is connected to the leaf spring 29. The circuit that is constituted in the gap between the above-mentioned outer case 3 and lighter body 2 and in the cover 4, as mentioned above, becomes a closed circuit when the leaf spring 29 contacts with the contact member 28 by an opening operation of the cover 4. If the circuit in the lighter 1 is closed, current flows in the circuit, and the light-emitting devices are lit. The luminous state of the light-emitting devices 23 is not limited to a simultaneous lighting of the light-emitting devices 23 of the outer case 3 and the cover 4. For example, the light-emitting devices 23 of the outer case 3 and the light-emitting devices 23 of the cover 4 may be



flickered in an alternate fashion, or each light-emitting device 23 may also be sequentially flickered as if a light source rotates round the lighter 1.

[0030] Furthermore, when the cover 4 is closed, the tongue segment 30 presses the leaf spring in the separating direction from the contact member 28, and the leaf spring 29 and the contact member 28 are separated, the light-emitting devices 23 are put out. Therefore, when the lighter 1 is in use, that is, during an ignition operation of the lighter 1 and during the continuation of the ignition, since the cover 4 is opened, the light-emitting devices 23 are continuously lit, however when the lighter 1 is not in use, since the cover 4 is closed, the light-emitting devices 23 are put out. For this reason, the lighter 1 can light the light-emitting devices 23 as needed only and prevents an unnecessary consumption of the battery 13.

[0031] In addition, the light-emitting devices 23 are lit by an opening operation of the cover 4, regardless of the ignition operation of the lighter 1. Therefore, when the lighter 1 is used as an alternative of flash light, etc., in dark place, etc., since the periphery can be illuminated by lighting the light-emitting devices 23 through an opening operation of the cover 4 without igniting, unlike

the conventional lighter, the lighter can also be used as a safer light source.

[0032] Next, the ignition operation of the lighter 1 will be explained.

[0033] If the operation button 5 of the ignition part is pressed, the lighter 1 is slid downward along the partition wall 19 of the lighter body 2. With the press operation of the operation button 5, the high-voltage generator 8 installed at one end of the operation button is also pressed down. If the high-voltage generator 8 is pressed down, the actuator 9 inserted into it is introduced into the inner part of the high-voltage generator 8 and presses the piezoelectric element 10 arranged in the high-voltage generator 8. If the piezoelectric element 10 is pressed by the actuator 9, a high voltage is generated by pressing and discharging. The high voltage generated in the piezoelectric element 10 is guided to the vicinity of the tip of the jet nozzle 7 of the ignition part by the discharge electrode 11.

[0034] On the other hand, as mentioned above, if the operation button 5 is pressed, the other end 15b of the movable arm 15 protruded to the moving area is pushed down. In the movable arm 15, as mentioned above, if the other end 15b is pushed down, one end 15a of the movable arm 15 which

is fitted to the small-diameter part 7b of the jet nozzle 7 is pushed up by using the point, which is supported by the above-mentioned support part 16, as a support point. Since one end 15a of the movable arm 15, as mentioned above, contacts with the lower surface of the large-diameter part 7a of the jet nozzle 7, the large-diameter part 7a is pushed up. If the large-diameter part 7a of the jet nozzle

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7 is pushed up, a gas opening valve not shown in the figure is fully opened, so that a fuel gas is jetted from the tip. [0035] Therefore, with the push-down operation of the operation button 5, since a high voltage generated by the piezoelectric element 10 is guided to the vicinity of the tip of the jet nozzle 7 and the fuel gas is jetted from the jet nozzle 7, a high voltage is ignited to the fuel gas, causing firing.

[0036] In addition, in the above-mentioned embodiment, the lighter has been explained as a disposable lighter, however if an injection opening for supplementing a fuel gas is arranged, the lighter can also be applied to a fuel exchange type lighter. Moreover, in the above-mentioned embodiment, the lighter 1 has been explained as a piezoelectric gas lighter, however without being limited to the piezoelectric lighter, lighters with other ignition

types may also be adopted as long as it is a lighter at which the cover 4 is mounted and has a space into which the light-emitting devices 23 connected by the conducting wire 25 are inserted.

[0037]

(Effects of the invention)

As explained in detail, according to the lighter of the present invention, with a simple operation of opening of the cover, the light-emitting bodies are lit on the surface of the lighter, so that a dynamic decoration rich in variety appears, thereby stimulating a purchase desire of consumers. In addition, since the decoration of the above-mentioned lighter is realized by installing the light-emitting device and the simple switch in a slight space of the outer case, the decoration is also easily applied to a small portable lighter.

#### Brief description of the figures

Figure 1 is a front view showing the lighter as an embodiment of the present invention.

Figure 2 is a front view showing a state in which a cover of said lighter is opened.

Figure 3 is a vertical sectional view showing said lighter.

Figure 4 is an enlarged oblique view showing the main parts of the constitution of a switch part when the cover is closed in said lighter.

Figure 5 is an enlarged oblique view showing the main parts of the constitution of the switch part when the cover is opened in said lighter.

Explanation of symbols:

- 1     Lighter
- 2     Lighter body
- 3     Outer case
- 4     Cover
- 5     Operation button
- 6     Metal cap
- 7     Jet nozzle
- 8     High-voltage generator
- 9     Actuator
- 10    Piezoelectric element
- 11    Discharge electrode
- 12    Hole part
- 13    Battery
- 14    Sandwiching part
- 15    Movable arm
- 16    Support part
- 17    Gas tank
- 18    Gas leading pipe
- 19    Partition wall
- 20    Hinge part
- 21    Ring part
- 23    Light-emitting device
- 24    Switch part
- 25    Conducting wire
- 26    Metal plate
- 27    Tube
- 28    Contact member
- 29    Leaf spring
- 30    Tongue segment

Figure 1

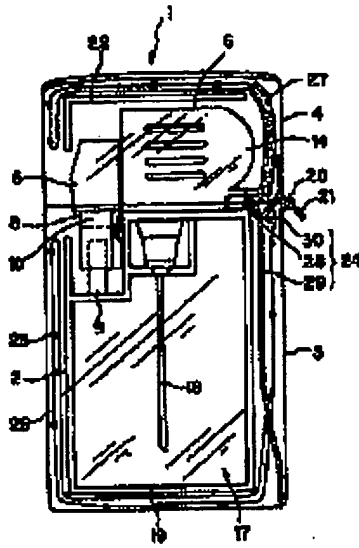


Figure 2

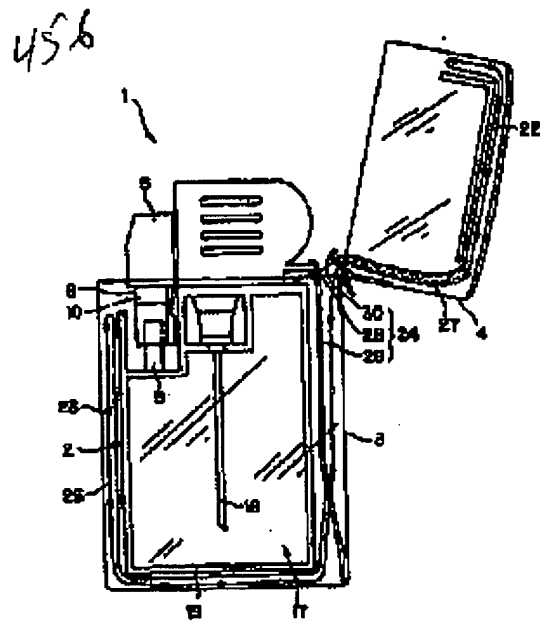


Figure 3

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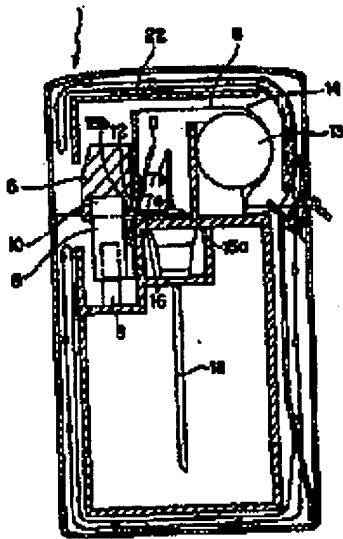


Figure 4

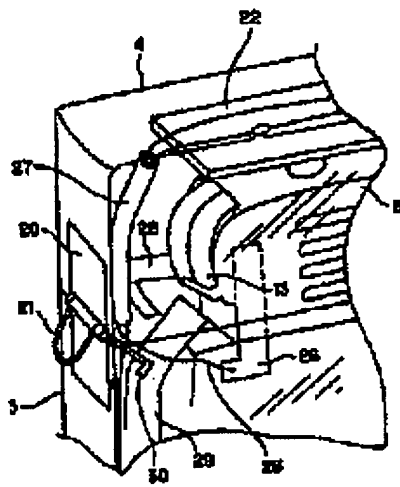


Figure 5

